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Submitted via email (Morrison.kay@epa.gov)

ATTN: Ballard Mine Comments
Kay Morrison
US EPA Region 10
1200 Sixth Ave., Suite 900
Mail Code: RAD-202-3
Seattle, WA 98101

Dear Ms. Morrison,

The Greater Yellowstone Coalition (GYC) appreciates the opportunity to provide comments on the Ballard Mine Proposed Plan (Plan). For 35 years, GYC has worked to protect the lands, waters, and wildlife of the Greater Yellowstone Ecosystem (GYE). The natural resources managed by the U.S. Environmental Protection Agency (EPA), Idaho Department of Environmental Quality (IDEQ), and U.S. Forest Service (USFS) are important to our members of southeast Idaho and critical to the health of the GYE. EPA, IDEQ, and USFS are important partners for conservation in southeast Idaho.

In the Plan, EPA identifies a Preferred Alternative for the cleanup of the Ballard Mine Site in Caribou County, Idaho. The Preferred Alternative is a combination of: 1) Upland Soil/Waste Rock Alternative 6 (Grading and Consolidation, Incidental Ore Recovery, Evapotranspiration Cover System, Institutional Controls, and Operations and Maintenance/Long-tern Monitoring); 2) Surface Water Alternative 3 (In Situ Biological [Wetlands] Treatment of Source Area Seepage); 3) Stream Channel Sediment and Riparian Soil Alternative 3 (Sediment Traps/Basins, Monitored Natural Recovery, and Institutional Controls); and 4) Groundwater Alternative 3 (Limited Permeable Reactive Barrier Treatment of Alluvial Groundwater, Monitored Natural Attenuation, and Institutional Controls).

Please accept and consider the following comments in your evaluation of the potential impacts to our natural resources resulting from the implementation of each of the Preferred Alternatives identified in the Plan.

I. Upland Soil/Waste Rock Alternative 6 (Grading and Consolidation, Incidental Ore Recovery, Evapotranspiration Cover System, Institutional Controls, and Operations and Maintenance/Long-tern Monitoring)

The Preferred Alternative for Upland Soil/Waste Rock includes Grading and Consolidation, Incidental Ore Recovery, Evapotranspiration Cover System, Institutional Controls, and Operations and Maintenance/Long-tern Monitoring. GYC encourages the agencies to evaluate and confirm the effectiveness of the final evapotranspiration cover system. The Plan states that, "The ET cover would prevent or greatly reduce release of contaminants to surface water and groundwater… would also address direct contact exposures with the underlying waste rock, prevent vegetative uptake in the upland areas of the site, and control releases of contaminants to riparian soil/sediment" (33).[1]

[1] United States Environmental Protection Agency. (2018, April) *Ballard Mine Proposed Plan*. Retrieved from US EPA website https://semspub.epa.gov/work/10/100089010.pdf

EPA has stated that site specific conditions, such as location, soil, landfill characteristics, as well as climate conditions, such as the amount of precipitation, seasonal distribution of precipitation, and form of precipitation, may "limit the use or effectiveness of an ET cover at a given site" (6).[2] In 2011, EPA reported that the ability to abate percolation is a performance criterion for final cover systems, and only "limited data are available about percolation performance and alternative designs (8)."[3] Given this statement regarding limited data for cover design effectiveness, EPA should incorporate a significant factor of safety with regard to both cover infiltration and evapotranspiration for final designs. Alternatively providing for a robust cover infiltration monitoring system to provide options for adaptive management should cover performance not meet the infiltration criteria.

GYC suggests that EPA and IDEQ monitor the following factors identified by EPA to maintain the effectiveness of the cover system for an extended period of time: settlement effects, gas emissions, erosion, slope failure, and vegetative cover maintenance (9).[4] GYC further recommends that the agencies ensure that the ET in fact prevents or greatly reduces the release of contaminants to surface water and groundwater. GYC additionally requests that the agencies confirm that the cover eliminates direct contact exposures, prevents vegetative uptake, and eliminates the releases of contaminants to riparian soil and sediment. With the discovery of selenium contamination in the 1990s, there is nearly 20 years worth of experimentation on effectiveness of covers in southeast Idaho. GYC encourages the EPA to fully understand what covers work in specific situations, a rigorous monitoring plan and adaptive management plan.

II. Surface Water Alternative 3 (In Situ Biological [Wetlands] Treatment of Source Area Seepage)

The Preferred Alternative for Surface Water includes In Situ Biological [Wetlands] Treatment of Source Area Seepage. GYC encourages the agencies to identify and implement a rigorous monitoring plan to ensure that the wetland treatment cells do not themselves become sources of contamination. The Plan determines that, "Once the ET cover system is constructed, storm-water and snowmelt will no longer contact contaminated waste material before entering nearby drainages…The un-impacted storm-water runoff is expected to meet PRGs…The ET cover system will substantially reduce precipitation and snowmelt from infiltrating through the waste rock" (35).[5]

EPA has cited to the alteration of natural hydrology, introduction of invasive species, disruption natural plant communities, disruption of animal communities as potentially harmful environmental impacts that can result from the improper planning, design, construction, and operation of constructed treatment wetlands, or wetland treatment cells (2).[6]

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[2] United States Environmental Protection Agency. (2011, February) *Fact Sheet on Evapotranspiration Cover Systems for Waste Containment.* Retrieved from US EPA website https://www.epa.gov/sites/production/files/2015-04/documents/fs_evap_covers_epa542f11001.pdf

[3] Ibid.

[4] Ibid.

[5] United States Environmental Protection Agency. (2018, April) *Ballard Mine Proposed Plan*. Retrieved from US EPA website https://semspub.epa.gov/work/10/100089010.pdf

[6] United States Environmental Protection Agency. (2004, August) *Constructed Treatment Wetlands*. Retrieved from US EPA website https://nepis.epa.gov/Exe/ZyPDF.cgi/30005UPS.PDF?Dockey=30005UPS.PDF

GYC suggests that EPA and IDEQ follow EPA's guidelines for a successful constructed treatment wetland, including site-specific examinations of soil suitability, hydrology, vegetation, the presence of endangered species, the presence of species of concern, critical wildlife corridors, and/or critical wildlife habitat (2).[7] GYC encourages the agencies to not only examine these qualities but identify a plan to protect priority conservation resources while avoiding further natural resource damage such as the introduction of invasive species. Furthermore, EPA and IDEQ should consider potential water quality impacts as well as impacts to the surrounding and future land uses. GYC additionally recommends that the agencies identify a rigorous monitoring plan to ensure that the wetland treatment cells do not themselves become sources of contamination. The adaptive management plan to be prepared during the remedial design phase should set clear standards for monitoring contaminants in the wetland treatment cells, create well-defined decision rules for determining whether the wetland treatment cells may remain in place, and create a precise process for the disposal of spent treatment media. Additionally, a rapid and reasonable time limit should be specified for the implementation of adaptive management actions.

III. Stream Channel Sediment and Riparian Soil Alternative 3 (Sediment Traps/Basins, Monitored Natural Recovery, and Institutional Controls)

The Preferred Alternative for Stream Channel Sediment and Riparian Soil includes Sediment Traps/Basins, Monitored Natural Recovery, and Institutional Controls. GYC encourages the agencies to identify a rigorous monitoring plan to ensure that the sediment traps/basins do not themselves become sources of contamination. The Plan concludes, "MNR is considered a feasible remedial alternative for these media because the recommended upland soil/waste rock ET cover would prevent contaminant source material from being transported offsite and into these drainages…the sediment/riparian soil in the downstream drainages would disperse and/or be covered naturally over time" (36).[8]

GYC recommends that the agencies identify a rigorous monitoring plan to ensure that sediment traps/basins do not themselves become sources of contamination. The adaptive management plan to be prepared during the remedial design phase should set clear standards for monitoring contaminants in sediment traps/basins, create well-defined decision rules for determining whether sediment traps/basins may remain in place, and create a precise process for the disposal of contaminated sediments. Long term risks and effects of abandoned or buried in place sediment traps becoming exposed and or eroded should be evaluated on a site or individual basis.

IV. Groundwater Alternative 3 (Limited Permeable Reactive Barrier Treatment of Alluvial Groundwater, Monitored Natural Attenuation, and Institutional Controls)

The Preferred Alternative for Groundwater includes Limited Permeable Reactive Barrier Treatment of Alluvial Groundwater, Monitored Natural Attenuation, and Institutional Controls. GYC encourages the agencies to identify a rigorous monitoring plan to ensure that the permeable reactive barriers (PRBs) do not themselves become sources of contamination. The Plan concludes, "To treat shallow alluvial groundwater, and more quickly achieve PRGs, PRBs would be installed at strategic locations along the margins of the cover, up-

[7] Ibid.
[8] United States Environmental Protection Agency. (2018, April) *Ballard Mine Proposed Plan*. Retrieved from US EPA website https://semspub.epa.gov/work/10/100089010.pdf

gradient of mine-influenced perennial seeps/springs…The objective of the PRBs is to reduce contaminant concentrations in shallow alluvial groundwater in the short term…As necessary, shallow groundwater that discharges as contaminated seeps and springs will be collected and routed to wetland treatment cells to achieve surface water PRGs…PRBs would be removed when no longer needed, unless it is shown that leaving the PRBs in place would not cause problems (36).[9]

EPA has cited to the long length of time it may take for down-gradient, groundwater quality to improve as a "major compliance challenge," and identifies "naturally slow groundwater flow at many sites, slow diffusion of contaminants from less accessible pores in the down-gradient aquifer, smearing of low-permeability materials across the face of the PRB during construction, and development of vertical gradients and stagnant zones in the PRB and in the down-gradient aquifer" as possible factors that contribute to lengthy clean up times (10).[10]

EPA has also observed that, as soon as installation is complete, "monitoring of both the reactivity of the media being used to remediate the contaminant and the
hydraulic performance of the PRB system should be incorporated into a long-term performance monitoring and maintenance plan for the system (8)."[11] Furthermore, if the agencies determine that the PRB system must be removed, then the PRB treatment materials must be disposed of appropriately, and the impacted area may require dewatering, backfilling, grading, and re-vegetation (10-11).[12] Monitoring for secondary water quality impairments, such as excess TOC, pH, arsenic, and/or iron, should also be performed (146).[13]

GYC suggests that EPA and IDEQ identify a rigorous monitoring plan to ensure that the PRBs do not themselves become sources of contamination. Should the PRBs themselves become sources of contamination, the agencies should follow their guidelines for the appropriate disposal of spent treatment materials and impacted area clean up. The adaptive management plan to be prepared during the remedial design phase should set clear standards for monitoring contaminants in the PRBs, create well-defined decision rules for determining whether the PRBs may remain in place, and create a precise process for the disposal of spent treatment media.

GYC believes our comments will help achieve the best possible clean-up of the Ballard Mine site. Thank you for your time and careful consideration of our comments on the Plan.

Sincerely,

Allison Michalski
Idaho Conservation Associate

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[9] United States Environmental Protection Agency. (2018, April) *Ballard Mine Proposed Plan*. Retrieved from US EPA website https://semspub.epa.gov/work/10/100089010.pdf

[10] United States Environmental Protection Agency. (2011, June) *Permeable Reactive Barrier: Technology Update*. Retrieved from US EPA website https://semspub.epa.gov/work/09/1142231.pdf

[11] Ibid.

[12] Ibid.

[13] Ibid.